

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

| | | |
|--|---|------------|
| APPLICATION OF NOLIN RURAL ELECTRIC |) | |
| COOPERATIVE CORPORATION FOR A |) | CASE NO. |
| CERTIFICATE OF PUBLIC CONVENIENCE AND |) | 2010-00518 |
| NECESSITY TO CONSTRUCT FACILITIES |) | |
| ACCORDING TO THE APPLICANT'S 12/01/10- |) | |
| 11/30/13 CONSTRUCTION WORK PLAN |) | |

FIRST INFORMATION REQUEST OF COMMISSION STAFF
TO NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION

Pursuant to 807 KAR 5:001, Nolin Rural Electric Cooperative Corporation ("Nolin") is to file with the Commission the original and five copies of the following information, with a copy to all parties of record. The information requested herein is due within seven days of the date of this request. Responses to requests for information shall be appropriately bound, tabbed and indexed. Each response shall include the name of the witness responsible for responding to the questions related to the information provided.

Each response shall be answered under oath or, for representatives of a public or private corporation or a partnership or association or a governmental agency, be accompanied by a signed certification of the preparer or person supervising the preparation of the response on behalf of the entity that the response is true and accurate to the best of that person's knowledge, information, and belief formed after a reasonable inquiry.

Nolin shall make timely amendment to any prior response if it obtains information which indicates that the response was incorrect when made or, though correct when made, is now incorrect in any material respect. For any request to which Nolin fails or refuses to furnish all or part of the requested information, Nolin shall provide a written explanation of the specific grounds for its failure to completely and precisely respond.

Careful attention should be given to copied material to ensure that it is legible. When the requested information has been previously provided in this proceeding in the requested format, reference may be made to the specific location of that information in responding to this request. When applicable, the requested information shall be separately provided for total company operations and jurisdictional operations.

1. Refer to the attached copy of Nolin's 2011-2013 Construction Work Plan ("CWP"), which was included by Nolin as an extra copy of the CWP filed with its application in this matter on December 22, 2010. The attached copy of the CWP is different in many respects from the original copy of Nolin's 2011-2013 CWP, which was filed with the application in this matter; e.g., the attached copy of the CWP does not contain pages 37-41 of the CWP that was part of the filed application, and the cell of the spreadsheet on page 7 of the attached copy labeled "Meters-AMR" reads "2106," whereas the copy filed with the application reads "2250." The pagination is also different in a number of places. For example, the last paragraph on page 4 of the attached copy which reads, "[n]ew distribution, transmission, and power supply requirements..." is on page 5 of the version attached to the filed application.

a. Explain in detail whether the attached copy of the CWP or the copy filed with the December 22, 2010 application in this matter (which can be viewed on

the Commission's website at: http://www.psc.ky.gov/PSCSCF/2010%20cases/2010-00518/20101222_nolin%20application.pdf), is the correct version of the CWP for purposes of the Commission's review of the application in this matter.

b. If known, explain in detail why the attached copy of the CWP is different from the copy filed with the December 22, 2010 filed application and how it came to be included with Nolin's application.

c. Refer to the Table of Contents at page 3 of either version of the CWP. Item Nos. 4 and 5 of the Table of Contents do not appear to be included in either the attached copy of the CWP or the CWP filed with the application. If sections of the CWP pertaining to Item Nos. 4 and 5 were inadvertently omitted, provide the omitted pages.

2. Refer to the Summary of Proposed 3 Year Construction With Cost, at pages 7 and 8 of the original version of the work plan filed with the application. On page 8 under Code 704, Load Management does not include any expenditure for any projects as part of this work plan. However, in the section of the CWP for "Required Line Construction Items," at page 39, a project for CFR Code 704, "Load Management/SCADA-Self Healing Project" in the amount of \$2,999,998 is included.

a. Is it Nolin's intention that this project be included in this work plan?

b. If yes, does its inclusion increase the cost of the CWP to \$15,916,336?

c. If yes, did RUS's December 8, 2010 approval include approval to proceed with the "Load Management/SCADA-Self Healing Project?"

(1) If no, has RUS given Nolin its approval to proceed with the "Load Management/SCADA-Self Healing Project" since December 8, 2010?

(2) If RUS has given Nolin its approval to proceed with the "Load Management/SCADA-Self Healing Project," provide a copy of the document in which RUS states its approval of the project.


Jeff Derouen
Executive Director
Public Service Commission
P.O. Box 615
Frankfort, KY 40602

DATED: MAR 03 2011

cc: Parties of Record



A Touchstone Energy[®] Cooperative 

2011-2013 CONSTRUCTION WORK PLAN

Prepared by
NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION
&
ENVISION ENERGY SERVICES
Roger Wilson, PE

December 2010



A Touchstone Energy[®] Cooperative 

2011-2013 CONSTRUCTION WORK PLAN

FOR NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION

KENTUCKY 51-HARDIN
ELIZABETHTOWN, KENTUCKY

PREPARED BY:

NOLIN RURAL ELECTRIC COOPERATIVE CORPORATION
&
ENVISION ENERGY SERVICES

December 2010

I hereby certify that this 2011-2013 Construction Work Plan was prepared by me or under my direct supervision and that; I am a duly registered professional engineer under the laws of this State Kentucky.

12-8-10
(Date)

By: Roger Dean Wilson by: Mary Soudgar
(Engineer, P.E.)

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EXECUTIVE

SUMMARY

PURPOSE OF REPORT

This report documents the January 2010 engineering analysis and summarizes the proposed construction of Nolin Rural Electric Cooperative Corporation's (NRECC) electric distribution system for the three-year planning period of 2011-2013.

The report also provides descriptions in the form of engineering support, costs and justification of new facilities to RUS for a loan application to finance proposed construction.

RESULTS OF PROPOSED CONSTRUCTION

Upon completion of the facilities proposed herein, the system will provide adequate and dependable service to 30,182 residential/farm consumers using an average of 1, 280 KWh per consumer per month, 1,675 commercial and small industrial consumers, and 3 large industrial consumers. The construction proposed will allow the NRECC distribution system to sustain a 226 MW peak demand.

GENERAL BASIS OF STUDY

The 2013 projected number of consumers and total peak system load were interpolated directly from the cooperative's 2010 Power Requirements Study (PRS) as approved by RUS. The peak system load projections were increased slightly to include additional new specific loads that were not anticipated when the PRS was prepared.

The cooperative has an approved Long-Range Plan (LRP) with new load projections and recommendations. NRECC has worked very closely with ENVISON ENERGY SERVICES in developing load projections and assumptions to be made for the construction work plan. All of the construction proposed herein is consistent with the LRP unless otherwise noted and explained.

The cooperative's August 18, 2010 operations and maintenance review, (Review Rating Summary; RUS Form 300), was used to determine construction required to replace physically deteriorated equipment and material, upgrade portions of the system to conform with code or safety requirements, and/or improve reliability or quality of service.

New distribution, transmission, and power supply requirements were considered simultaneously as a "one system" approach for the orderly and economical development of the total system. All of the proposed construction and recommendations herein, relative to power supply and delivery, were discussed and approved by the cooperative's power supplier, East Kentucky Power Cooperative (EKPC).

A complete list of the lines and equipment and their estimated cost, (all based on recent historical data), required to serve new members is developed in Section 1-C. A similar list and cost of necessary service upgrades to existing members is in Section 3.

An analysis, using as a basis RUS guidelines and the design criteria herein, of thermal loading, voltages, physical conditions and reliability was performed on all of the substations, distribution lines, and major equipment of the existing system. Milsoft's WINDMIL (version 7) was used to analyze the distribution circuits during the estimated 2013 winter extreme peak loading period of 226MW.

For each deficiency that was determined, alternate solutions were investigated and economically evaluated so that the most effective construction, if required, could be proposed.

SERVICE AREA & POWER SUPPLY

Nolin Rural Electric Cooperative Corporation, whose headquarters are in Elizabethtown, Kentucky, provides service in the rural areas of two counties and small portions of six counties in the central portion of the state as shown on the following map. The service area is comprised mostly of rolling, forested hills and has two small lakes. NRECC's service area surrounds Elizabethtown and Hodgenville, both of which are served by an investor-owned utility.

Most of the economy of the area is based on commercial industries and agriculture. NRECC has and will continue to serve the moderate growth of new commercial, manufacturing, and residential consumers adjacent to Elizabethtown. However, an industrial park is being proposed in the southern portion of the Hardin County area, served by NRECC, which may have dramatic impact on that portion of the system.

The following data is from NRECC's 12/2009 RUS Form 7:

| | |
|-------------------------------|--------------|
| Number of Consumers in place: | 33,864 |
| MWh Purchased: | 725,585 |
| MWh Sold: | 696,022 |
| Total Utility Plant: | \$90,431,112 |
| Consumers/Mile: | 11.84 |

Eighty-five primary distribution circuits are served from 22 separate distribution transformers and 18 different substation sites. All of the distribution circuits are energized at 7,200/12,470 Volts, grounded WYE. Installed conductor sizes range from #4 ACSR to 366.4 MCM ACSR. Almost all primary construction is overhead with a small percentage of new and existing plants being underground primary. The underground primary ranges in sizes from #2 AL to 500 MCM AL.

East Kentucky Power Cooperative provides all of the power and energy needs to Nolin Rural Electric Cooperative Corporation, plus 15 other distribution cooperatives, by virtue of a standard "all power requirement" contract. EKPC is a RUS financed G&T cooperative with offices in Winchester, Kentucky.

EKPC constructs, owns, operates, and maintains the 23 substations and 69,000-Volt transmission lines, which supply NRECC's distribution system. The substation low-side voltage is 7,200/12,470 Volts, grounded WYE.

| CODE | DESCRIPTION | NUMBER OF | AVERAGE | YEAR 1 | YEAR 2 | YEAR 3 | TOTAL |
|------------|--|---------------|-----------|------------------|------------------|------------------|---------------------|
| | [Continued from previous page] | | | | | | |
| 610 | ROAD MOVES -SITES SPECIFIED | | | | | | |
| 610.1 | CWP ITEM 10_2_ABC(Ditto Lane-HWY313) | 1.4 | \$121,216 | | \$169,702 | | \$169,702 |
| 610.2 | CWP ITEM 20_2_ABC (Rineyville Rd Reloc.) | 1.9 | \$161,153 | \$306,191 | | | \$306,191 |
| 610.3 | CWP ITEM 20_2_ABC (Rineyville Rd Ext.) | 0.7 | \$161,153 | | | \$112,807 | \$112,807 |
| | 610--SUB-TOTAL | 4.0 mi | | | | | \$388,700 |
| 611 | LINE RELOCATION- SAFETY OR ACCESS | | | | | | |
| 611.1 | CWP ITEM 9_6_ABC (Centennial Avenue) | 1.7 | \$161,153 | | | \$273,960 | \$273,960 |
| 611.2 | CWP ITEM 7_5_B (Lee School Road) | 2.2 | \$38,058 | | \$83,728 | | \$83,728 |
| 611.3 | CWP ITEM 4_2&3_ABC (DC - Hodgenville) | 1.5 | \$181,472 | \$272,208 | | | \$272,208 |
| | 611--SUB-TOTAL | 5.4 mi | | | | | \$329,896 |
| | 610 & 611--SUBTOTAL | 9.4 mi | | \$578,399 | \$253,430 | \$388,767 | \$1,218,596 |
| 615 | UTILITIES | | | | | | -0- |
| 701 | SECURITY LIGHTS | 567 | \$1,070 | \$196,371 | \$202,230 | \$208,467 | \$607,068 |
| | | | | | | | |
| 704 | ROAD MARKINGS | | | | | | -0- |
| | TOTAL WORK PLAN | | | | | | \$12,916,338 |

STATUS OF 2008-2009 WORK PLAN 300'S PROJECTS

| CODE | DESCRIPTION | PROGRESS |
|------|--|----------|
| 306 | CWP ITEM 20_2_A (Mega Plex) 3 PH-500MCM URD | Delete |
| 307 | CWP ITEM 17_4_A (Chattsworth-Pine Valley) 3PH 336.4 ACSR | Done |
| 308 | CWP ITEM 12_4_A (St. Johns-St. Johns Rd)--3PH 336.4 ACSR | Delete |
| 311 | CWP ITEM 16_3_A (Locust Grove RD)-3PH 336.4 ACSR | Done |
| 379 | CWP ITEM 5_1_O (Mt.Sherman--1PH-3PH 3/0) | Done |
| 312 | CWP ITEM 13_3_A (Callie Farm) 4/0 URD | Done |
| 313 | CWP ITEM 22_2-2A (Fd From New Sub) Rineyville | Done |
| 314 | CWP ITEM 13_4_A (Boone Road) 336.4 ACSR | Done |
| 315 | CWP ITEM 3_2_A (Gaither St..Scenic Oak) | Done |
| 316 | CWP ITEM 1_2_A (Sub to Stovall) 336.4 ACSR | Done |
| 317 | CWP ITEM 13_3_A (Claramont Decker School Road) | Done |
| 318 | CWP ITEM 10_3_A (Arlington Woods) URD | Done |
| 320 | CWP ITEM 22_1_B (Service Point Flint Ink) URD | Done |
| 321 | CWP ITEM 22_1_A (Tharp II to Flint Ink) 336.4 AA | Done |
| 322 | CWP ITEM (amendment I Rosenberger Road) 1/0 ACSR 3PH | Done |
| 323 | CWP ITEM (amendment II North Miles Road) 336.4 ACSR 3PH | Done |
| 324 | CWP ITEM (amendment II Highway 313) 336.4 ACSR 3PH | Done |
| | | |
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BASIS OF STUDY AND PROPOSED CONSTRUCTION

DESIGN CRITERIA

Each of the following design criteria items was reviewed by the RUS General Field Representative on June 1, 2010 and his provisional concurrence was attained.

Construction proposed herein is required to meet the following minimum standards of adequacy for voltages, thermal loading, safety and reliability on the system.

1. Voltage levels on primary distribution lines are to fall between 117 and 126 Volts on a 120 base.
2. The following equipment is not to be thermally loaded by more than the percentage shown on its nameplate rating (winter loading)
 - Power Transformers 130% Winter ; 100% Summer
 - Voltage Regulators 130% Winter ; 100% Summer
 - Auto-Transformer 130% Winter ; 100% Summer
 - Reclosers 100% Winter or Summer
 - Line Fuses 80% Winter or Summer
3. Primary conductors are not to be loaded over 75% of their thermal rating. A case-by-case limit is used for the major tie lines between substations to allow for different back feed situations.
4. Poles and/or crossarms are to be replaced if found to be physically deteriorated by visual inspection and/or tests.
5. Conductors (and associated poles and hardware as required) will be considered for replacement if found to be poor condition, having excessive sag or in need of being changed out on a systematic basis.
6. Primary distribution lines are to be rebuilt and/or relocated if they are found to be unsafe or fail to meet the applicable National Electrical Safety Code clearances.
7. New lines and line conversions to be built according to the standard primary voltage levels as determined after review of the Long Range Plan, present loading and future load growth projection.
8. New primary conductor sizes to be determined on a case-by-case basis using the Economic Conductor Sizing Computer Program and presently valid constants and variables. The final proposed conductor may be modified to conform to the cooperative's standard sized and recommendations of the Long Range Plan.

9. All new primary construction is to be overhead except where underground is required to comply with governmental or environmental regulations, local restrictions or favorable economics.
10. All new distributions lines are to be designed and built according to RUS standard construction specifications and guidelines.
11. System improvements to correct voltage drop and improve phase balance will be made on single and two-phase lines with loads exceeding 50 amps or 70 consumers (based on Operating and Engineering practices).
12. Power factor correction is to be made when the substation power factor decreases below 95% lagging at peak load or 95% leading at minimum load. Power factor corrections with capacitors are to be located for maximum loss reduction with considerations given for voltage improvements.
13. Due to the increased loading of ice and wind in recent years, Nolin will take into consideration (where appropriate) the changes recommended by the Public Services Commission; which include the shorting of spans, heavier pole classes, and additional guying strengths.

(The preceding criteria are used for design purposes only. It is not meant to be inclusive of all criteria that can or should be used in making recommendations for construction work.)

DISTRIBUTION LINE AND EQUIPMENT COSTS

| DESCRIPTION | 2007-2009 COST/MILE | 2011-2013 PROPOSED |
|--------------------------|---------------------|--------------------|
| SINGLE PHASE OVHD | | |
| #2 ACSR | \$35,904 | \$38,058 |
| SINGLE PHASE URD | | |
| #1/0 STR AL 15KV | \$58,869 | \$62,401 |
| THREE PHASE OVHD | | |
| #2 ACSR | \$105,864 | \$112,216 |
| #3/0 ACSR | \$106,709 | \$121,029 |
| #336.4 MCM ACSR | \$142,085 | \$161,153 |
| #336.4 MCM AA MOD. | \$140,131 | \$158,937 |
| #336.4 MCM ACSR—D.C. | ✓ \$160,000 | \$181,472 |
| THREE-PHASE URD | | |
| #1/0 STR AL | \$113,512 | \$128,745 |
| #4/0 STR AL | \$206,646 | \$234,378 |
| #500 MCM STR AL | \$203,863 | \$231,221 |

NOTES:

The cost/mile provided was obtained from a 24-month historical average cost from data in the 219 forms.

✓ No actual projects available adjusted as new construction of 2009 cost.

Increase criteria for next three year period:

- 6% increase contractor labor
- 6% increase Nolin labor
- 7% increase aluminum wire [separation of cost (30% project cost wire, remainder is hardware & labor)]

ANALYSIS OF LONG RANGE PLAN

Nolin Rural Electric Cooperative Corporation has completed a Long Range Plan in 2000 that projected system improvements and load growth through 2020. The study was performed by Hi-Line Engineering from Marietta, Georgia.

The report planned for the development of Nolin RECC's distribution system to a future configuration with the capacity to serve approximately 1.5 times the winter peak load of 1998-1999. The Long Range Plan for the distribution system called for maintaining the current distribution voltages. Five new substations were recommended to be constructed. Tunnel Hill II, Elizabethtown II, and Rineyville are now completed. Tharp II has been recently completed in the year 2009 and incorporated into the system with additional distribution lines.

The Long Range Plan was conducted with the final loading of the Nolin RECC's distribution system being equal to 289.6 MW. The second five-year loading block anticipated a system of peak of 225.6 MW. The highest actual system loading was in the winter of 2008-2009 peaking at 226MW, indicating a very close tracking to the Long Range Plan's system predictions as well as the individual substations. The system is growing with a strong residential and commercial growth with expectations of continued development. The Power Requirement Study for Nolin RECC mirrors a very similar growth pattern to the actual development model.

The Long Range Plan does indicate a new substation to be place in the Valley Creek Area for support of the Hodgenville and Williams Substations. With the advent of substation loading indicated by the Power Requirement Study in demands, compared to Substation KVA ratings of East Kentucky Power, it will be prudent to evaluate this area for maximum benefit of existing line sectionalizing and/or upgrading substations. The loading percentages are, at the close of the proposed work plan, within the maximum allowable demands. The third block of growth in the Long Range Plan will require an evaluation of substation loading for Hodgenville, Kargle, Tharp, Upton and Williams (as noted in the projected Winter & Summer Substation Loading Table). This evaluation will be done within this work plan period to coordinate an expected completion time of the Valley Creek Area Substation construction before a critical peak will be reached.

It is concluded that the Long Range Plan is adequate for this work plan. With the arrival of growth in particular areas and summer peak loading becoming a concern, it would be advantageous to observe the actual growth patterns in relationship to the characteristics presented in the Long Range Plan's distribution of loads for the second block of five year loading.

SECTIONALIZING STUDIES

Nolin Rural Electric Cooperative Corporation performed a study in 2008 and 2009 on independent circuits, which had prominent changes in loading due to growth or line switching. The practice of annually analyzing the over-current coordination of all new or significant changes in circuits is good engineering practice.

Upon closing of individual Construction Work Plan projects a continuous loading efficiency evaluation and a study performed on the OCRs, fuses, and other devices required to adequately protect the circuits due to changes. NRECC will continue a maintenance program that will provide testing or changing approximately one-fourth of the systems OCRs annually.

ANALYSIS OF 2010 OPERATIONS & MAINTENANCE SURVEY

In August 18, 2010, an Operation and Maintenance Survey (O & M Survey) of the NRECC distribution system was conducted. Line and pole inspection records, voltage and current test records, special equipments records, outage records, and a field survey of the underground distribution system comprised the basis for the system analysis and rating.

Transmission lines and distribution substations are owned and maintained by East Kentucky Power Cooperative (EKPC) and has been excluded from the rating process.

In general, the overhead and underground distribution facilities were found to be in satisfactory condition. All of the operations and maintenance, and engineering programs were found to be satisfactory.

It is recommended to continue the program of inspecting approximately 8500 poles per year. The method of inspection is ground patrol and utilizing personnel that are working on mapping projects. It is anticipated that approximately 2 percent of the poles will be found to be physically deteriorated and require replacement. The estimated cycle to inspect all of NRECC's distribution poles is 4 years.

Our system, as well as the surrounding electric systems, experienced two events 2009 that tested our construction beyond the normal design criteria. The ice loading was over a half inch with heavy wind and a second event of intense wind. The weather events posed a comprehensive review of the system inspection, tree trimming and building technology for transmission and distribution lines as well as joint use attachments. The results were reviewed by the Public Service Commission of Kentucky.

NRECC has a program to clear its overhead distribution line rights-of-way on a 5-year cycle. This requires clearing of approximately 500 miles each year by contract tree trimming crews. Due to increased growth of shade trees in urban areas, it is recommended that NRECC evaluate increased tree trimming in these urban areas. An alternate program would be a tree replacement plan for danger trees.

NRECC will continue to work with the telephone and cable television companies to remove poles that have been abandon by the cooperative and still have joint-use-attachments to the old poles.

SUBSTATION LOADING TABLE FOR PEAK MONTHS HISTORICAL & PROJECTED WINTER SEASON

| SUBSTATION | TRANSFORMER # | KVA SIZE | WINTER RATING | HISTORICAL | | PROJECTED | |
|------------------|---------------|----------|---------------|------------|--------------------|-----------|-----------|
| | | | | PEAK KW | LOAD AS A % OF MAX | PEAK KVA | % SUB MAX |
| COLESBURG | 3 | 5,600 | 7,900 | 3,900 | 49% | 4,300 | 54% |
| ELIZABETHTOWN I | 3 | 11,200 | 18,000 | 10,100 | 42% | 4,400 | 24% |
| ELIZABETHTOWN II | 1 | 11,200 | 15,300 | 9,400 | 35% | 9,600 | 63% |
| GLENDALE | 3 | 10,000 | 15,700 | 12,300 | 72% | 11,700 | 75% |
| HODGENVILLE | 1 | 11,200 | 15,600 | 12,500 | 68% | 12,500 | 80% |
| MAGNOLIA | 1 | 11,200 | 15,600 | 10,500 | 59% | 10,600 | 68% |
| STEPHENSBURG | 3 | 10,000 | 15,600 | 11,600 | 59% | 11,900 | 76% |
| UPTON | 3 | 4,200 | 8,300 | 4,700 | 57% | 5,500 | 66% |
| VERTREES | 3 | 10,000 | 15,700 | 8,800 | 49% | 8,700 | 55% |
| VINEGROVE | 3 | 14,000 | 18,000 | 12,400 | 49% | 11,000 | 61% |
| RADCLIFF | 3 | 14,000 | 18,000 | 12,100 | 56% | 13,000 | 72% |
| TUNNEL HILL I | 3 | 14,000 | 18,000 | 8,300 | 36% | 8,200 | 46% |
| TUNNEL HILL II | 1 | 11,200 | 17,800 | 11,800 | 58% | 11,800 | 66% |
| THARP I | 3 | 11,200 | 18,000 | 14,860 | 83% | 11,100 | 62% |
| THARP II (#2) | 1 | 14,000 | 18,000 | 4200 | 83% | 4,500 | 25% |
| SMITHERSVILLE I | 1 | 14,000 | 18,000 | 11,900 | 57% | 12,300 | 68% |
| SMITHERSVILLE II | 1 | 14,000 | 18,000 | 11,600 | 46% | 10,500 | 58% |
| FORT KNOX | 1 | 14,000 | 18,200 | 11,900 | 50% | 11,100 | 61% |
| KARGLE I | 1 | 11,200 | 16,100 | 11,700 | 82% | 11,400 | 71% |
| KARGLE II | 1 | 11,200 | 16,700 | 10,500 | 71% | 7,800 | 47% |
| WILLIAMS | 1 | 11,200 | 18,100 | 14,500 | 70% | 14,600 | 81% |
| LOGSDON | 1 | 11,200 | 18,100 | 6,700 | 37% | 8,700 | 48% |
| RINEYVILLE | 1 | 11,200 | 15,600 | 9,400 | 58% | 9,800 | 63% |

MAX. PEAK TOTAL

235,660

PEAK TOTAL USED IN CWP FOR SUBSTATIONS

225,000

NOTES:

PROJECTED (extreme) PEAKS FROM THE PRS 2010 DATA .
HISTORICAL PEAK ARE FROM THE ACTUAL PEAK WINTER
MONTH NON-CP BILLING FROM EKPC IN THE LAST 11
YEARS.

SUBSTATIONS THAT EXCEED 80% IN PROJECTED PEAKS
ARE REVIEWED MONTHLY FOR POTENTIAL ISSUES.

SUBSTATION LOADING TABLE FOR PEAK MONTHS HISTORICAL & PROJECTED SUMMER SEASON

| SUBSTATION | TRANSFORMER # | KVA SIZE | SUMMER RATING | HISTORICAL | | PROJECTED | |
|------------------|------------------|----------|------------------|------------|-----------------------|------------|--------------|
| | | | | PEAK KW | LOAD AS A % OF MAX | PEAK KW | % SUB MAX |
| COLESBURG | 3 | 5,600 | 5,400 | 5,800 | 107% | 2,800 | 52% |
| ELIZABETHTOWN I | 3 | 11,200 | 11,200 | 11,000 | 98% | 5,100 | 46% |
| ELIZABETHTOWN II | 1 | 11,200 | 10,500 | 7,900 | 75% | 8,100 | 77% |
| GLENDALE | 3 | 10,000 | 10,000 | 8,400 | 84% | 7,800 | 78% |
| HODGENVILLE | 1 | 11,200 | 10,500 | 8,300 | 79% | 8,200 | 78% |
| MAGNOLIA | 1 | 11,200 | 10,800 | 6,700 | 62% | 6,700 | 62% |
| STEPHENSBURG | 3 | 10,000 | 10,500 | 7,200 | 69% | 8,100 | 77% |
| UPTON | 3 | 4,200 | 4,200 | 3,400 | 81% | 3,600 | <u>86%</u> |
| VERTREES | 3 | 10,000 | 10,900 | 7,200 | 66% | 5,900 | 54% |
| VINEGROVE | 3 | 14,000 | 12,900 | 9,900 | 77% | 8,900 | 69% |
| RADCLIFF | 3 | 14,000 | 12,900 | 9,500 | 74% | 8,000 | 62% |
| TUNNEL HILL I | 3 | 14,000 | 12,900 | 12,100 | 94% | 9,000 | 70% |
| TUNNEL HILL II | 1 | 11,200 | 11,200 | 8,500 | 76% | 8,700 | 78% |
| THARP (1). | 3 | 11,200 | 11,200 | 13,500 | 121% | 10,500 | <u>94%</u> |
| THARP (2) | 3 | 11,200 | 11,200 | 2,800 | 25% | 3,100 | 28% |
| SMITHERSVILLE I | 1 | 14,000 | 12,800 | 7,000 | 55% | 7,800 | 61% |
| SMITHERSVILLE II | 1 | 14,000 | 12,800 | 7,800 | 61% | 7,400 | 58% |
| FORT KNOX | 1 | 14,000 | 12,800 | 8,600 | 67% | 8,100 | 63% |
| KARGLE I | 1 | 14,000 | 12,900 | 12,200 | 95% | 11,400 | <u>88%</u> |
| KARGLE II | 1 | 14,000 | 12,900 | 13,200 | 102% | 7,000 | 54% |
| WILLIAMS | 1 | 11,200 | 10,900 | 9,600 | 88% | 10,000 | <u>92%</u> |
| LOGSDON | 1 | 11,200 | 10,900 | 6,900 | 63% | 7,100 | 65% |
| RINEYVILLE | 1 | 11,200 | 10,900 | 5,100 | 47% | 6,000 | 55% |

MAX. PEAK TOTAL 192,600

PEAK TOTAL USED IN CWP FOR SUBSTATIONS

169,300 KW

NOTES: PROJECTED (extreme 20%) PEAKS FROM THE PRS 2010 DATA .
HISTORICAL PEAK ARE FROM THE ACTUAL PEAK SUMMER MONTH
NON-CP BILLING FROM EKPC IN THE LAST 11 YEARS.

SUBSTATIONS THAT EXCEED 80% IN PROJECTED PEAKS ARE REVIEWED
MONTHLY FOR POTENTIAL ISSUES.

HISTORICAL OUTAGES SUMMARY

| YEAR | POWER SUPPLIER | MAJOR STORM | SCHEDULE | ALL OTHER | TOTAL |
|--------------------|-----------------------|--------------------|-----------------|------------------|----------------|
| 2005 | 0.4 | 40.5 | 0.2 | 52.2 | 93.3 |
| 2006 | 0 | 60.7 | 0 | 44 | 104.8 |
| 2007 | 0 | 0 | 0.01 | 20.2 | 20.4 |
| 2008 | 0 | 166.1 | 0.2 | 42.2 | 208.5 |
| 2009 | 1 | 8636* | 0.2 | 40.6 | 8677.8 |
| <i>5 year ave.</i> | <i>0.28</i> | <i>1780.66</i> | <i>0.122</i> | <i>39.84</i> | <i>1820.96</i> |

Notes:

Data from RUS Form 7 December report and Cooperative records.

*Extreme ice storms in the month of January and a damaging windstorm in the early spring.

HISTORICAL COST REQUIRED TO SERVE NEW MEMBERS & PROJECTIONS FOR FUTURE BY YEAR

| | ACTUAL | | PROPOSED | | | | | | TOTAL 3 YEAR PERIOD |
|--|--------------------|----------------------|---------------|-----------------|--|------------------|---------------|-----------------|---------------------------|
| | 2007-2009 UNITS | 2007-2009 \$/UNIT | Units 2011 | \$/Unit 2011 | Units 2012 | \$/ Unit 2012 | Units 2013 | \$/Unit 2013 | |
| <i>NEW SERVICES</i> | | | | | | | | | |
| <i>Under-ground</i> | 1460 | \$1,800 | 600 | \$1,854 | 650 | \$1,910 | 700 | \$1,967 | \$3,730,800 |
| <i>Commercial</i> | 20 | \$20,710 | 1 | \$21,331 | 1 | \$21,971 | 1 | \$22,630 | \$65,932 |
| <i>Over-head</i> | 544 | \$1,205 | 70 | \$1,325 | 70 | \$1,378 | 70 | \$1,431 | \$289,380 |
| <i>TRANSFORMER</i> | | | | | | | | | |
| <i>OVER-HEAD</i> | 1517 | \$1,047 | 210 | \$1,078 | 210 | \$1,111 | 210 | \$1,144 | \$699,930 |
| <i>UNDERGROUND</i> | 285 | \$1,887 | 462 | \$1,944 | 462 | \$2,002 | 462 | \$2,062 | \$2,775,696 |
| <i>COMMERICAL 3ph</i> | 49 | \$8,721 | 5 | \$8,983 | 5 | \$9,252 | 5 | \$9,530 | \$138,825 |
| | | | | | | | | | |
| <i>INSTALLED METERS</i> | | | | | | | | | |
| <i>3 PHASE-MTR</i> | 321 | \$82 | 107 | \$450 | 107 | \$464 | 107 | \$477 | \$148,837 |
| <i>SINGLE PH. MTR</i> | 2106 | \$150 | 700 | \$170 | 750 | \$175 | 800 | \$180 | \$394,250 |
| | | | | | | | | | |
| <i>SERVICE DROPS</i> | | | | | | | | | |
| <i>UPGRADED</i> | 180 | \$1,723 | 80 | \$2,000 | 80 | \$2,060 | 80 | \$2,122 | \$494,560 |
| | | | | | | | | | |
| <i>SECURITY LIGHTS</i> | | | | | | | | | |
| <i>SECURITY LIGHTS</i> | 518 | \$1,009 | 189 | \$1,039 | 189 | \$1,070 | 189 | \$1,103 | \$607,068 |
| <i>Deducted 16% of units for street lights</i> | | | | | | | | | |
| | | | | | | | | | |
| <i>POLE REPLACEMENTS</i> | | | | | | | | | |
| <i>POLE CHANGED AS CODE- 606</i> | 486 | \$1,380 | 60 | \$2,141 | 60 | \$2,205 | 60 | \$2,271 | \$397,020 |
| <i>POLE IMPROVED AS CODE 609</i> | 782 | \$1,312 | 140 | \$2,141 | 140 | \$2,205 | 140 | \$2,271 | \$926,380 |
| | | | | | | | | | |
| <u>'3' YEAR TOTAL</u> | | | | | <i>This 3 Year Total excludes 300s, 610s, 611s, & 702 codes that follow this page.</i> | | | | \$10,668,678 |

NOTE:

*The costs provided are obtained from 24 months of historical average figures from the 219 forms.
Actual '\$/Unit' was inflated by a reasonable amount per year for escalation to the 'Proposed Cost'.
The low physical count of single connections is a reflection of the multi-family units, which had one contact point to
service several consumers.*

**REQUIRED LINE CONSTRUCTION
ITEMS IN DETAIL FOR:**

300's

610's

611's

&

700's

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|------------------|
| YEAR: | 2013 |
| CFR CODE: | 327 |
| CWP ITEM NUMBER: | 9_6_ABC |
| ESTIMATED COST: | \$231,221 |
| GENERIC NAME: | Veterans Way URD |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conversion of a single phase #4 ACSR line [20_2 starting at PROH13233] to a URD 500mcm feeder for a new development and road relocation named Veterans Way. The length of the construction project is 5000' (1 mile).

REASON FOR PROPOSED CONSTRUCTION

The new development is within the boundary of Elizabethtown and is required to have all new construction underground by city zoning. The #4 ACSR will not be able to carry the expected 5MW load.

RESULTS OF PROPOSED CONSTRUCTION

Project will adequately serve the new development and meet the city zoning requirements of underground facilities.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

The option of upgrading an adjacent line or construction of a substation proved to be too costly.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|------------------------|
| YEAR: | 2012 |
| CFR CODE: | 328 |
| CWP ITEM NUMBER: | 7_5_B |
| ESTIMATED COST: | \$15,223 |
| GENERIC NAME: | Copeland Road to Store |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conductor conversion of a single phase #4 ACSR line [7_5_B starting at PROH200178] to a #2 ACSR. The project will run about 10 spans along Copeland Road from Flint Hill Road. The length of the construction project is 2,300' (.4 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The #4 ACSR is deteriorated with long spans and the voltage drop for this area is of minimal standard.

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|----------------------------|
| YEAR: | 2012 |
| CFR CODE: | 329 |
| CWP ITEM NUMBER: | 7 5 B |
| ESTIMATED COST: | \$53,281 |
| GENERIC NAME: | Cash Road (off Flint Hill) |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conductor conversion of a single phase #4 ACSR line [7_5_B starting at PROH200005] to a #2 ACSR. The length of the construction project is 7,500' (1.4 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The #2 ACSR will provide additional strength to longer spans and improve the voltage drop for this area..

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|------------|
| YEAR: | 2011 |
| CFR CODE: | 330 |
| CWP ITEM NUMBER: | 4 2 B |
| ESTIMATED COST: | \$114,174 |
| GENERIC NAME: | Keith Road |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conductor conversion of a single phase #4 ACSR line [7_5_B starting at PROH189194] to a #2 ACSR. The length of the construction project is 15,800' (3 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The #2 ACSR will provide additional strength to longer spans and improve the voltage drop for this area..

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|---------------------------------------|
| YEAR: | 2013 |
| CFR CODE: | 331 |
| CWP ITEM NUMBER: | 8 4 C |
| ESTIMATED COST: | \$68,504 |
| GENERIC NAME: | Horn Road <i>off Hardinsburg Road</i> |

DESCRIPTION OF PROPOSED CONSTRUCTION

Re-conductor of a single phase #2ACSR line [8_4_C starting at PROH189360] to a #2 ACSR. The length of the construction project is 9,500' (1.8 mile).

REASON FOR PROPOSED CONSTRUCTION

Horn Road has multiple long taps feeding the area which has reflected an area of long outages and frequent conductor failures. Consolidating the main feeder will shorten outage time, will provide shorter spans and improve the voltage drop for this area..

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The configuration develops a better capacity of back feed capability of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|------------------------------|
| YEAR: | 2012 |
| CFR CODE: | 332 |
| CWP ITEM NUMBER: | 4 3 ABC |
| ESTIMATED COST: | \$338,421 |
| GENERIC NAME: | Salem Church Road Conversion |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conversion of a three phase #2 ACSR line [4_3_ABC starting at PROH920] to a #336.4 ACSR. The length of the construction project is 11,500' (2.1 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The #4 ACSR will provide additional strength to longer spans and improve the voltage drop for this area..

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION

| | |
|------------------|-----------------------------|
| YEAR: | 2011 |
| CFR CODE: | 333 |
| CWP ITEM NUMBER: | 22_4_A |
| ESTIMATED COST: | \$208,099 |
| GENERIC NAME: | Sport Center -St. John Road |

DESCRIPTION OF PROPOSED CONSTRUCTION

Convert conductor and conversion of a Single phase #4 ACSR line [22_4_A starting at PROH31041] to a URD #500 MCM Three phase circuit. The length of the construction project is 4,900' (.9 miles).

REASON FOR PROPOSED CONSTRUCTION

The line will serve a new development of complex of several football, baseball, other athletic fields which will have a heavy volume of vehicles and pedestrians traffic. The underground will provide adequate service for the new load and less conflict with high mast lighting installation and maintenance of fields.

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level and the existing line is upgraded to newer wire for improved serve and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

The option of upgrading an adjacent line or construction of a substation proved to be too costly.

CODE **610** SECTION - DETAILS

NEW CONSTRUCTION ITEM—LINE CONVERSION —FOR ROAD MOVE

| | |
|------------------|-----------------------------------|
| YEAR: | 2012 |
| CFR CODE: | 610.1 |
| CWP ITEM NUMBER: | 10 2 ABC |
| ESTIMATED COST: | \$169,702 |
| GENERIC NAME: | Ditto Lane Section of Highway 313 |

DESCRIPTION OF PROPOSED CONSTRUCTION

Re-conductor and conversion of a three phase #3/0 ACSR line [10_2_ABC starting at PROH42261] to a #336.4 MCM ACSR. The length of the construction project is 7,500' (1.4 mile). Environmental evaluation of the project area was completed in the State Transportation Division of Highways, and is on file with the highway road plans.

REASON FOR PROPOSED CONSTRUCTION

The area served by this line has a high density of new homes and is in the high growth area where Highway 313 is being built. The highway construction required modification of the facilities.

NEW CONSTRUCTION ITEM—LINE CONVERSION – FOR ROAD MOVE

| | |
|------------------|-------------------------------|
| YEAR: | 2011 |
| CFR CODE: | 610.2 |
| CWP ITEM NUMBER: | 20_2_ABC |
| ESTIMATED COST: | \$306,191 |
| GENERIC NAME: | Rineyville Road Relocated1600 |

DESCRIPTION OF PROPOSED CONSTRUCTION

Re-conductor of a three phase #4/0 ACSR line [20_2_ABC starting at PROH29612] to a #336.4 MCM ACSR. The length of the construction project is 10,000' (1.9 mile). Environmental evaluation of the project area was completed in the State Transportation Division of Highways, and is on file with the highway road plans.

REASON FOR PROPOSED CONSTRUCTION

The #336.4 MCM ACSR will provide additional strength to longer spans and improve the voltage drop for this area. The area served by this line has a high density of new homes and is in the high growth area where Highway #1600 is being built. The highway construction required modification of the facilities.

NEW CONSTRUCTION ITEM—LINE CONVERSION— FOR ROAD MOVE

| | |
|------------------|-------------------------------|
| YEAR: | 2013 |
| CFR CODE: | 610.3 |
| CWP ITEM NUMBER: | 20_2_ABC |
| ESTIMATED COST: | \$112,807 |
| GENERIC NAME: | Rineyville Road Extended 1600 |

DESCRIPTION OF PROPOSED CONSTRUCTION

Re-conductor and conversion of a three phase #3/0 ACSR line [20_2_ABC starting at PROH195947] to a #336.4 ACSR. The length of the construction project is 3,700' (.7mile). Environmental evaluation of the project area was completed in the State Transportation Division of Highways, and is on file with the highway road plans.

REASON FOR PROPOSED CONSTRUCTION

The area served by this line has a high density of new homes and is in the high growth area where Highway #1600 is being built. The highway construction required modification of some of the facilities.

CODE **611** SECTION DETAILS

NEW CONSTRUCTION ITEM—LINE CONVERSION – FOR RELOCATION

| | |
|------------------|-------------------|
| YEAR: | 2013 |
| CFR CODE: | 611.1 |
| CWP ITEM NUMBER: | 14 4 ABC |
| ESTIMATED COST: | \$273,960 |
| GENERIC NAME: | Centennial Avenue |

DESCRIPTION OF PROPOSED CONSTRUCTION

An existing three phase #3/0 ACSR line is converted to three phase 336.4 ACSR line identified as starting with PROH196223. The length of the construction project is 9000' (1.7 miles).

REASON FOR PROPOSED CONSTRUCTION

The voltage drop at the end of the furthest point will be improved as calculated to above 118 Volts at the projected kW growth. The line construction replaces old 3/0 ACSR wire and poles for a new more reliable feed. The line will be relocated out of a dense tree growth area to an easier accessed road right of way and fence line.

RESULTS OF PROPOSED CONSTRUCTION

The three-phase configuration provides a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved serve and reliability. The larger wire develops a higher capacity of back feed between Vine Grove Substation and Fort Knox Substations.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

The option of upgrading an adjacent line did not provide the same benefits and would have been a longer route.

NEW CONSTRUCTION ITEM—LINE CONVERSION— FOR RELOCATION

| | |
|------------------|-----------------|
| YEAR: | 2012 |
| CFR CODE: | 611.2 |
| CWP ITEM NUMBER: | 7_5_B |
| ESTIMATED COST: | \$83,728 |
| GENERIC NAME: | Lee School Road |

DESCRIPTION OF PROPOSED CONSTRUCTION

Re-conductor and pole change of a single phase #4 ACSR line [7_5_B starting at PROH196227] to a #2 ACSR. The length of the construction project is 11,200' (2.2 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The #2 ACSR will provide additional strength to longer spans and improve the voltage drop for this area. The line will be relocated out of a dense tree growth area to an easier accessed road right of way and fence line.

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level; the voltage is corrected to above 118 Volts; and the line is upgraded to newer poles and wire for improved service and reliability. The larger wire develops a better capacity of back feed capability and balance of phases.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

NEW CONSTRUCTION ITEM—LINE CONVERSION— FOR RELOCATION

| | |
|------------------|----------------------|
| YEAR: | 2011 |
| CFR CODE: | 611.3 |
| CWP ITEM NUMBER: | 4_1_ABC |
| ESTIMATED COST: | \$272,208 |
| GENERIC NAME: | D.C. Hodgenville Sub |

DESCRIPTION OF PROPOSED CONSTRUCTION

Conversion of a Single Circuit three phase #3/0 ACSR line [4_1_ABC starting at PROH7482] to a Double Circuit #336.4 ACSR. The length of the construction project is 8,000' (1.5 mile).

REASON FOR PROPOSED CONSTRUCTION

The line has reflected an area of long outages and frequent conductor failures. The wind and ice storms of previous years has demonstrated the cross country route to be troublesome and difficult to maintain. The spacer cable has proved to be a better option for service in this type area.

RESULTS OF PROPOSED CONSTRUCTION

This configuration can provide a better balance of phases at the substation level and line is upgraded to newer poles and wire for improved serve and reliability. The spacer cable wire develops a more reliable back feed capability and balance of phases for substations.

ALTERNATE CORRECTIVE PLANS INVESTIGATED

No other option of upgrading was investigated because of the terrain and heavy rocky soil would have made the cost to expensive.

CODE **704** SECTION DETAILS

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